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HOPLOLAIMUS GALEATUS, A LANCE NEMATODE PATHOGENIC TO PINES.

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INTRODUCTION

Silviculture is the largest single agricultural enterprise in Florida and represents several millions of cultivated acres. Species of conifers, mostly native to the state, predominate as cultivated trees. Several types of soil-inhabiting plant parasitic nematodes are reported from forest plantations exhibiting poor growth (2,3,4). The lance nematodes, Hoplolaimus spp., were first reported in association with pines (Pinus nigra Arnold) at Valparaiso, Florida (5). Since then lance nematodes (Hoplolaimus spp.) have been reported from pine tree nurseries in Georgia and Florida (1,4). Longleaf pine (P. palustris Mill.) and slash pine (P. elliottii Engelm.) have been reported as hosts for Hoplolaimus galeatus (Cobb, 1913) Thorne, 1935 (4).

HOST-PARASITE RELATIONSHIPS

Surveys of selected forest areas revealed a lance nematode, H. galeatus, in abundance from sites exhibiting poor growth (5).

Studies of nematode reproduction determined that populations of Hoplolaimus galeatus increased 16.05 and 33.75 times the original population, respectively, when grown on slash and loblolly pine (Pinus taeda L.) (4).

In greenhouse experiments, H. galeatus severely stunted loblolly pine after 6 months, with increasing damage as the nematode population increased. Two-thirds of the pine seedlings that were planted in soil containing the highest inoculation density (46,900 nematodes/pot) died during the 6-month test period. Root systems infected by the highest inoculum level were practically devoid of healthy lateral roots and mycorrhizae (5).

Histopathological studies showed that H. galeatus infects and severely damages slash and loblolly pines by feeding in the cortical zone of roots. These nematodes invaded lateral and mycorrhizal short roots and caused extensive damage (2).

GEOGRAPHIC DISTRIBUTION AND HOST RANGE

Hoplolaimus galeatus is widely distributed in the Atlantic Coastal states from New England through Florida. It also occurs from the Gulf of Mexico coastal states through Wisconsin and Minnesota and as far west as Colorado (6). H. galeatus is also reported from Canada, Central America, and India (7). In addition to its pathogenicity to pines, H. galeatus can cause serious damage to cotton, oak, wheat, and is highly pathogenic to and of widespread occurrence on most of the turf grasses grown in Florida (7).

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Hosts other than Pinus spp. include Cynodon dactylon Pers. (Bermuda grass), Stenotaphrum secundatum Kuntze (St. Augustine grass), Zoysia matrella Merr. (Manila grass), Medicago sativa L. (alfalfa), Saccharum officinarum L. (sugarcane), Acer spp., Picea spp., Prunus spp., Quercus spp., Trifolium pratense L. (red clover), Trifolium repens L. (white clover), Zea mays L. (corn), and Vicia villosa Roth (hairy vetch) (7).

H. galeatus is capable of feeding on many different hosts from various taxonomic groups. Crops used in rotation and weeds growing in fields infested with H. galeatus should be carefully evaluated for host suitability to this nematode.

CONTROL ON PINUS SPP.

Preplant applications of D-D (1,3-dichloropropene + 1, 3-dichloropropane) at 20 gal/A reduced field populations of H. galeatus on slash pine. Slash and loblolly pines grew best when planted in areas treated with D-D (20 gal/A). Seedlings of longleaf pine grew faster following applications of D-D and were taller than untreated trees after 5 years (4).

SURVEY AND DETECTION

1) Pines that exhibit poor growth or general unthriftiness may be suspected of being damaged by plant parasitic nematodes.

2) Soil and roots should be collected from representative affected plants.

3) Submit samples to a nematology laboratory for diagnosis.

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